

CP Algebra II
Mrs. Britton
Chapter 7 Review

Name: Key
Date: _____

Add or subtract each set of polynomials.

1. $(5x^3 + 3 + 3x^2 - x) + (7x^3 - x - 6)$
 $5x^3 + 3 + 3x^2 - x + 7x^3 - x - 6$
 $12x^3 + 3x^2 - 2x - 3$

2. $(9x^2 + 3x - 2) - (2x^2 - 7x + 8)$
 $9x^2 + 3x - 2 - 2x^2 + 7x - 8$
 $7x^2 + 10x - 10$

Classify the polynomials by degree and number of terms:

3. $x^3 - 18$
Cubic binomial

4. $4x^2 - 3x + 4$
quadratic trinomial

5. $x^2 - 5x^4 + 3x^3 - 2$
quartic polynomial

Evaluate each for the given value of x:

6. $x^3 - 4x^2 - 8$ when $x = -2$
-32

7. $2x^4 + x^3 - 5$ when $x = 3$
184

Describe the end behavior for each function:

8. $f(x) = -3x^6 + 3x^4 + 3x^3$
Falls left, Falls right

9. $f(x) = -4x^3 - 4x^2 + 2x + 6$
Rises left, Falls right

10. $f(x) = 6x^3 + 3x^2 - 2$
Falls left, ~~Rises~~ Right

Find any local minima and maxima for the following functions. State where the function increases and decreases (in interval notation). Sketch the graph of each function:

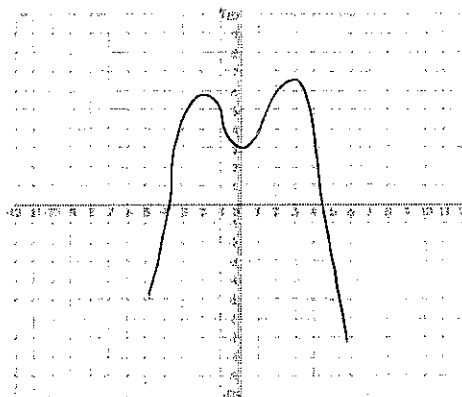
11. $f(x) = -x^4 + 3 + 3x^2$

Max: $(-1, 2, 5, 3), (1, 2, 5, 3)$

Min: $(0, 3)$

Increases: $[-\infty, -1, 2] \cup [0, 1, 2]$

Decreases: $[-1, 2, 0] \cup [1, 2, \infty)$



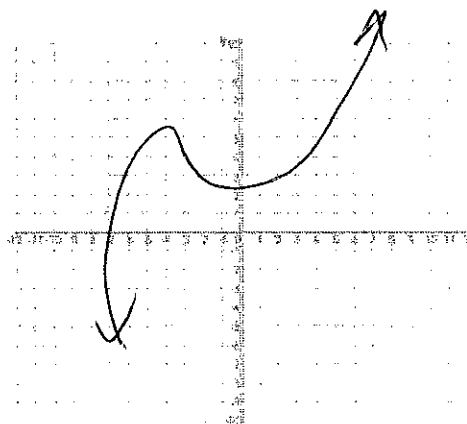
12. $f(x) = 3x^3 + 4x^2 - 6x - 2$

Max: $(1, 4, 6)$

Min: $(.48, -3.6)$

Increases: $(-\infty, -1.37] \cup [.48, \infty)$

Decreases: $[-1.37, .48]$



Solve each by factoring:

13. $x^3 - 11x^2 + 30x = 0$

$x(x^2 - 11x + 30) = 0$

$x(x-5)(x-6) = 0$

$x = 0 \quad x = 5 \quad x = 6$

Divide Using Long Division:

15. $(3x^3 - 10x^2 + 10x - 4) \div (x - 2)$

$$\begin{array}{r} 2 \overline{) 3 - 10 10 - 4} \\ \underline{3 - 6 - 8 4} \\ 3 - 4 2 0 \end{array}$$

$3x^2 - 4x + 2$

14. $12x^4 + 22x^3 = -8x^2$

$\frac{12x^4}{2x^2} + \frac{22x^3}{2x^2} + \frac{8x^2}{2x^2} = 0$

$2x^2(6x^2 + 11x + 4) = 0$

$2x^2(6x+8)(6x+3) = 0$

$x = 0 \quad x = -\frac{4}{3} \quad x = -\frac{1}{2}$

16. $(x^3 + 5x^2 - 18) \div (x + 3)$

$$\begin{array}{r} -3 \overline{) 1 5 0 - 18} \\ \underline{1 - 3 - 6 18} \\ 1 2 - 6 0 \end{array}$$

$x^2 + 2x - 6$

Divide Using Synthetic Division:

17. $(x^5 + 6x^3 - 5x^4 + 5x - 15) \div (x - 3)$

$x^4 - 2x^3 + 5$

18. $(x^3 - 2x^2 + 40 - 22x) \div (x - 4)$

$x^2 + 2x - 14 - \frac{16}{x-4}$

Find the zeros of each Polynomial Function/Equation:

19. $f(x) = x^3 + 2x^2 - 15x$

$x = -5$
 $x = 0$
 $x = 3$

20. $x^3 - 12x = 16$

$x^3 - 12x - 16 = 0$

$x = -2$
 $x = 4$

21. $f(x) = x^3 - 4x^2 - 3x + 12$

$4 \overline{) 1 \ -4 \ -3 \ 12}$
 \downarrow
 $1 \ 0 \ -3 \ 0$

$x^2 - 3 = 0$

$x = \frac{\pm \sqrt{0^2 - 4(1)(-3)}}{2}$

$x = \frac{\pm \sqrt{12}}{2} \quad 2\sqrt{3} \quad x = \pm \frac{2\sqrt{3}}{2}$

$x = 4$
 $x = \sqrt{3}$
 $x = -\sqrt{3}$

22. $x^3 - 10 = -5x^2 + 2x$

$x^3 + 5x^2 - 2x - 10 = 0$

$-5 \overline{) 1 \ 5 \ -2 \ -10}$
 \downarrow
 $1 \ 0 \ -2 \ 0$

$x^2 - 2 = 0$

$x = \frac{\pm \sqrt{0^2 - 4(1)(-2)}}{2}$

$x = \frac{\pm \sqrt{8}}{2} \quad x = \pm \frac{2\sqrt{2}}{2}$

$x = -5$
 $x = \sqrt{2}$
 $x = -\sqrt{2}$

23. $f(x) = x^3 - 5x^2 + 9x - 45$

$5 \overline{) 1 \ -5 \ 9 \ -45}$
 \downarrow
 $1 \ 0 \ 9 \ 0$

$x^2 + 9 = 0$

$x = \frac{\pm \sqrt{0^2 - 4(1)(9)}}{2}$

$x = \frac{\pm \sqrt{-36}}{2}$

$x = \pm \frac{6i}{2}$

$x = 5$
 $x = 3i$
 $x = -3i$

24. $x^3 - 12 = 3x^2 - 4x$

$x^3 - 3x^2 + 4x - 12 = 0$

$3 \overline{) 1 \ -3 \ 4 \ -12}$
 \downarrow
 $1 \ 0 \ 4 \ 0$

$x^2 + 4 = 0$

$x = \frac{\pm \sqrt{0^2 - 4(1)(4)}}{2}$

$x = \frac{\pm \sqrt{-16}}{2}$

$x = 3$
 $x = 2i$
 $x = -2i$

Represent the product as a polynomial in standard form.

25. $(x+6)(2x-3)$

$2x^2 - 3x + 12x - 18$

$2x^2 + 9x - 18$

26. $(5x^2 + 2x - 1)(3x + 7)$

$15x^3 + 35x^2 + 6x^2 + 14x - 3x - 7$

$15x^3 + 41x^2 + 11x - 7$

